

**WHAT IS CLAIMED IS:**

1. A transmitter for speech coding and decoding by using an additional bit allocation method, comprising:

5 a standard speech coder for receiving a speech signal while dividing the speech signal into spectrum information representing a vocal tract function and an excited signal component and generating standard coded bit streams by performing modeling, quantizing, and coding with respect to the spectrum information and the excited signal;

10 a quality enhancement coder for obtaining errors between the quantized signal and the desired signal with respect to each of the spectrum information and the excited signal component, and generating coded bit streams by performing additional quantization with respect to the obtained errors; and,

15 a multiplexing block for multiplexing the bit streams obtained at each of the coders and transmitting the multiplexed bit streams to a receiver.

2. The transmitter according to claim 1, wherein the quality enhancement coder quantizes each of the errors by using additional bits to perform multi-stage quantization.

20 3. The transmitter according to claim 1, wherein the quality enhancement coder uses a vector quantization method for additional quantization.

4. The transmitter according to claim 1, wherein the spectrum information is an LSP parameter.

5. The transmitter according to claim 1, wherein the quality

enhancement coder performs additional quantization with respect to a predetermined part of the spectrum information in accordance with quantization performance of the standard speech coder.

6. The transmitter according to claim 1, wherein the quality enhancement coder comprises:

an LSP error quantization block for receiving an unquantized LSP parameter and a quantized LSP parameter from the standard speech coder and performing a quantization procedure with respect to errors of the two LSP parameters; and,

an excited signal error quantization block for receiving an unquantized excited signal and a quantized excited signal from the standard speech coder and performing a quantization procedure with respect to errors of the two excited signals.

7. The transmitter according to claim 1, wherein the quality enhancement coder comprises an LSP interpolation information quantization block for minimizing parameter errors between the LSP parameter obtained at each sub-frame of the standard speech coder and the LSP parameter obtained through a quantization procedure and an interpolation procedure by using additional bits.

8. A receiver for speech coding and decoding by using an additional bit allocation method, comprising:

a demultiplexing block for receiving bit streams of a speech signal and demultiplexing the bit streams of the speech signal to generate an LSP index and an additional LSP index to compensate the error of spectrum information of

the speech signal, and an excited signal index and an additional excited signal index to compensate the error of an excited signal component of the speech signal;

a standard speech decoder for receiving the multiplexed index signals, performing a dequantization procedure with respect to spectrum information and an excited component of the speech signal and restoring the speech signal by combining the dequantized spectrum information and excited signal component with a corresponding error component of the spectrum information and the excited signal; and,

a quality enhancement decoder for receiving the additional LSP index and the additional excited signal index and generating error components of the spectrum information and the excited signal by performing a dequantization procedure with respect to the additional LSP index and the additional excited signal index.

9. The receiver according to claim 8, wherein the standard speech coder comprises:

an LSP dequantization block for receiving the LSP index and restoring an LSP parameter by performing a dequantization procedure with respect to the LSP index;

an excited signal dequantization block for receiving the excited signal index and restoring the excited signal by performing a dequantization procedure with respect to the excited signal index; and,

a speech combining block for respectively combining error components of the spectrum information and the excited signal into the restored LSP

parameter and the excited signal and restoring the speech signal by processing the two combined signals.

10. The receiver according to claim 8, wherein the quality enhancement block comprises:

5            an LSP error dequantization block for receiving the LSP index and generating an error component of the spectrum information by performing a dequantization procedure with respect to the LSP index; and,

            an excited signal error dequantization block for receiving the additional excited signal index and generating an error component of the excited signal by  
10          performing a dequantization procedure with respect to the additional excited signal index.